

## CLAIMS

We claim:

1. An isolated coronavirus genome comprising the nucleic acid as set forth in  
5 SEQ ID NO: 1.

2. An isolated coronavirus protein comprising the amino acid sequence as set  
forth in:

SEQ ID NO: 2 (polyprotein 1a);  
10 SEQ ID NO: 3 (polyprotein 1b);  
SEQ ID NO: 4 (S protein);  
SEQ ID NO: 5 (X1 protein);  
SEQ ID NO: 6 (X2 protein);  
SEQ ID NO: 7 (E protein);  
15 SEQ ID NO: 8 (M protein);  
SEQ ID NO: 9 (X3 protein);  
SEQ ID NO: 10 (X4 protein);  
SEQ ID NO: 11 (X5 protein); or  
SEQ ID NO: 12 (N protein).

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3. An isolated nucleic acid molecule encoding any one of the proteins according  
to claim 2.

25 4. The isolated nucleic acid molecule of claim 3, comprising a nucleotide  
sequence as set forth in:

nucleotides 265 to 13,398 of SEQ ID NO: 1 (polyprotein 1a);  
nucleotides 13,398 to 21,482 of SEQ ID NO: 1 (polyprotein 1b);  
nucleotides 21,492 to 25,256 of SEQ ID NO: 1 (S protein);  
nucleotides 25,268 to 26,089 of SEQ ID NO: 1 (X1 protein);

- nucleotides 25,689 to 26,150 of SEQ ID NO: 1 (X2 protein);  
nucleotides 26,117 to 26,344 of SEQ ID NO: 1 (E protein);  
nucleotides 26,398 to 27,060 of SEQ ID NO: 1 (M protein);  
nucleotides 27,074 to 27,262 of SEQ ID NO: 1 (X3 protein);  
5 nucleotides 27,273 to 27,638 of SEQ ID NO: 1 (X4 protein);  
nucleotides 27,864 to 28,115 of SEQ ID NO: 1 (X5 protein); or  
nucleotides 28,120 to 29,385 of SEQ ID NO: 1 (N protein).

5. A method of detecting a severe acute respiratory syndrome-associated  
10 coronavirus (SARS-CoV) in a sample, comprising:  
contacting the sample with a pair of nucleic acid primers that hybridize to a  
SARS-CoV nucleic acid, wherein at least one primer is 5'-end labeled with a reporter  
dye;  
amplifying the SARS-CoV nucleic acid or a fragment thereof from the sample  
15 utilizing the pair of nucleic acid primers;  
electrophoresing the amplified products; and  
detecting the 5'-end labeled reporter dye, thereby detecting a SARS-CoV.

6. The method of claim 5, wherein the amplification utilizes reverse  
20 transcriptase-polymerase chain reaction.

7. The method of claim 5, wherein at least one of the nucleic acid primers that  
hybridize to a SARS-CoV nucleic acid comprises a sequence as set forth in any one of  
SEQ ID NOs: 13-15.

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8. A method of detecting a severe acute respiratory syndrome-associated  
coronavirus (SARS-CoV) in a sample, comprising:  
contacting the sample with a pair of nucleic acid primers that hybridize to a  
SARS-CoV nucleic acid;

amplifying the SARS-CoV nucleic acid or a fragment thereof from the sample utilizing the pair of nucleic acid primers;

adding to the amplified SARS-CoV nucleic acid or the fragment thereof a TaqMan SARS-CoV probe that hybridizes to the SARS-CoV nucleic acid, wherein the  
5 TaqMan SARS-CoV probe is labeled with a 5'-reporter dye and a 3'-quencher dye;  
performing one or more additional rounds of amplification; and  
detecting fluorescence of the 5'-reporter dye, thereby detecting a SARS-CoV.

9. The method of claim 8, wherein the amplification utilizes reverse  
10 transcriptase-polymerase chain reaction.

10. The method of claim 8, wherein at least one of the nucleic acid primers that hybridize to a SARS-CoV nucleic acid and/or the TaqMan SARS-CoV probe that hybridizes to the SARS-CoV nucleic acid comprises a sequence as set forth in any one  
15 of SEQ ID NOs: 16-33.

11. A method of detecting a severe acute respiratory syndrome-associated  
coronavirus (SARS-CoV) in a biological sample comprising antibodies, comprising:  
contacting the biological sample with a SARS-CoV-specific antigen, wherein  
20 the antigen comprises a SARS-CoV organism; and  
determining whether a binding reaction occurs between the SARS-CoV-specific antigen and an antibody in the biological sample if such is present, thereby detecting SARS-CoV.

25 12. A method of detecting a severe acute respiratory syndrome-associated coronavirus (SARS-CoV) in a biological sample comprising polypeptides and/or fragments thereof, comprising:  
contacting the biological sample with a SARS-CoV-specific antibody; and

determining whether a binding reaction occurs between the SARS-CoV-specific antibody and a SARS-CoV polypeptide or fragment thereof in the biological sample if such is present, thereby detecting SARS-CoV.

5           13. The method of claim 12, wherein determining whether a binding reaction occurs between the SARS-CoV-specific antibody and a SARS-CoV polypeptide or fragment thereof is carried out *in situ* or in a tissue sample.

10           14. The method of claim 12, wherein determining whether a binding reaction occurs between the SARS-CoV-specific antibody and a SARS-CoV polypeptide or fragment thereof comprises an immunohistochemical assay.

15           15. A kit for detecting a severe acute respiratory syndrome-associated coronavirus (SARS-CoV) in a sample, comprising:  
a pair of nucleic acid primers that hybridize under stringent conditions to a SARS-CoV nucleic acid, wherein one primer is 5'-end labeled with a reporter dye.

20           16. The kit of claim 15, wherein at least one of the nucleic acid primers that hybridize to a SARS-CoV nucleic acid comprises a sequence as set forth in any one of SEQ ID NOs: 13-15.

17. A kit for detecting a severe acute respiratory syndrome-associated coronavirus (SARS-CoV) in a sample, comprising:  
a pair of nucleic acid primers that hybridize under high stringency conditions to a SARS-CoV nucleic acid; and  
a TaqMan SARS-CoV probe that hybridizes to the SARS-CoV nucleic acid, wherein the TaqMan SARS-CoV probe is labeled with a 5'-reporter dye and a 3'-quencher dye.

18. The kit of claim 17, wherein at least one of the nucleic acid primers that hybridize to a SARS-CoV nucleic acid and/or the TaqMan SARS-CoV probe that hybridizes to the SARS-CoV nucleic acid comprises a sequence as set forth in any one of SEQ ID NOs: 16-33.

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19. A kit for detecting a severe acute respiratory syndrome-associated coronavirus (SARS-CoV) in a biological sample, comprising:  
an isolated SARS-CoV organism.

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20. A composition comprising an isolated severe acute respiratory syndrome-associated coronavirus (SARS-CoV) organism.

21. The composition of claim 20, wherein the isolated SARS-CoV organism is an inactive isolated SARS-CoV organism.

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22. The composition of claim 21, further comprising at least one component selected from the group consisting of pharmaceutically acceptable carriers, adjuvants and combinations of two or more thereof.

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23. A method of eliciting an immune response against an antigenic epitope in a subject, comprising introducing into the subject the composition of claim 22, thereby eliciting an immune response in the subject.